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Presentation of the 1995 A.N. Richards Award to Maurice Burg

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Maurice Burg was born in 1931 in Boston, Massachusetts, where he lived for the next 26 years. As a young boy he was chubby, quite different from his physique today (Fig. 1). He loved sports, especially baseball, and participated in the Boy Scouts of America, where he rose to the highest rank of an Eagle Scout. His father taught him fly fishing and took him on trips to the Laurentides in Canada. Fly fishing still remains Maurice Burg's ardent passion.

Maurice Burg was an excellent student at Newton High School (Table 1) and in 1948 in an international aptitude test received a scholarship with an honorable mention on a national radio broadcast. With this scholarship he entered Harvard College in Cambridge, Massachusetts, where his major in psychology turned his interests to medicine. In 1952 he married Judith Anne Braverman. From 1952 to 1955 he studied medicine at Harvard Medical School. During college and medical school he earned money as a waterfront counselor and instructor of swimming and canoeing at a summer camp for children.

His mentor during his residency, who led to his interest in renal physiology, was Maurice Strauss of Boston University Medical School. In 1957 Maurice Burg's scientific career began when he entered the NIH Laboratory of Kidney and Electrolyte Metabolism in Bethesda, Maryland. Here he became Deputy Chief in 1975 and one year later Chief of that institution, a position which he still holds. Himself widowed, he married Ruth Cooper Breslauer in 1967. Both have four children and two grandchildren.

All of Maurice Burg's scientific work could be subsumed under the heading of renal transport mechanisms and their regulation (Table 2). His mentor, with whom he published together until 1970, was Jack Orloff. The first work was done on kidney slices and separated tubules, where oxygen consumption, transport of sodium, potassium, chloride and para-aminohippurate were studied. The big breakthrough came with the technique of isolated perfused tubules, published in 1966 together with Grantham, Abramow, and Orloff. In the following two decades microperfusion studies were performed in cortical collecting ducts, thick ascending limbs, and proximal straight tubules (Table 2).

The impact of these studies on renal physiology is best summarized by the statement of Mark Knepper, a long time associate of Maurice Burg: "The knowledge gained from isolated perfused tubule studies forms the basis for what every medical student is taught today about nephron function."

Since the early 1980s, Maurice Burg has turned his interest to cultured kidney cells and to the role of osmolytes in the renal medulla. During this highly productive period, fundamental work, including gene expression of the respective enzymes and transporters and their regulation, was done in conjunction with Joe Handler on sorbitol, aldose reductase, glyceryl-phosphoryl-choline, myoinositol and betaine. Maurice Burg (Fig. 2) has deservedly received great recognition for his scientific work (Table 3). Today, the A.N. Richards Award can be added to his impressive list of accomplishments. Speaking for the audience, I congratulate him and wish him good luck for the future.

Fig. 1.

Table 1. Overview of Maurice B. Burg's career

1948	Graduate, Newton High School, Newton, Massachusetts
1952	A.B. cum laude, Harvard College, Cambridge, Massachusetts
1955	M.D. Harvard Medical School, Boston, Massachusetts
1955	Intern in Medicine, Beth Israel Hospital, Boston, Massachusetts
1956	Resident in Medicine, Boston V.A. Hospital, Boston, Massachusetts
1957–1974	Investigator, NIH Laboratory of Kidney and Electrolyte Metabolism, Bethesda, Maryland
1974–1975	Deputy Chief, NIH Laboratory of Kidney and Electrolyte Metabolism, Bethesda, Maryland
1975–present	Chief, NIH Laboratory of Kidney and Electrolyte Metabolism, Bethesda, Maryland
1990–present	Adjunct Professor of Medicine, The Johns Hopkins University School of Medicine, Baltimore, Maryland

Table 2. Themes of research

Renal transport mechanisms and their regulation		
Orloff	1962	Kidney slices
	1964	Separated tubules: Oxygen consumption, transport of Na^+, K^+, Cl^-, PAH
Grantham Abramow	1966	Microperfused tubules
Kokko Helman Frindt Stoner		Cortical collecting duct: Transport of Na^+, K^+, Cl^-, HCO_3^-, Ca^{2+} (PTH), NH_3 (NH_4^+), urea, water, effect of pH, ADH, cAMP, mineralocorticoids, amiloride.
N. Green Cardinal		Thick ascending limb: Transport of Cl^-, HCO_3^-, NH_3/NH_4^+ water, effect of furosemide, mersalyl, ethacrynic acid.
Warnock McKinney Bourdeau Knepper Good		Proximal straight tubule: Transport of CO_2/HCO_3^-, NH_3/NH_4^+, water, Effect of DOCA, PTH.
Osmolytes in renal medulla and their regulation		
N. Green Handler Balaban	1982	Cultured cells
Kador Garcia Peres Nakanishi Moriyama and others	1989	Gene expression and its regulation: Sorbitol, aldose reductase[a], glyceryl-phosphoryl-choline, myoinositol[a], betaine[a]

[a] Enzyme or transporter cloned (together with J. Handler)

Fig. 2.

Table 3. Honors

1948	National Honor Society Scholarship
1977	Homer Smith Award in Renal Physiology
1986	Ciba Award, American Heart Association
1991	Elected Member to National Academy of Science
1994	Walter B. Cannon Memorial Award Lecture